
# GREEN PROMOTION & REPORTING PROGRAM 2017

BALTIMORE/WASHINGTON INTERNATIONAL Thurgood Marshall AIRPORT

# INTRODUCTION

This report was compiled to describe the steps the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) is taking to promote conservation and sustainability in their owned and operated facilities, as well as the data collection and reporting methods to track performance of each strategy. Efforts required for permit compliance are not included in this report. MDOT MAA's commitment to sustainability is exemplified in the following areas: leadership, air quality, recycling and waste management, energy, water, ground transportation, and natural environment.

## LEADERSHIP

Environmental stewardship is a priority for the MDOT and all of their business units, including the MDOT MAA. The MDOT Mission Statement identifies Environmental Stewardship as one of the six goals identified to support the achievement of MDOT's vision and mission.

MARYLAND DEPARTMENT OF TRANSPORTATION

**MISSION STATEMENT**

"The Maryland Department of Transportation is a customer-driven leader that delivers safe, sustainable, intelligent, and exceptional transportation solutions in order to connect our customers to life's opportunities."

### GOAL #4: ENVIRONMENTAL STEWARDSHIP

"Ensure the delivery of the State's transportation infrastructure program conserves and enhances Maryland's natural, historic and cultural resources."
http://www.mdot.maryland.gov/newMDOT/Mission_Vision/mission.html

MDOT MAA is moving forward with the expansion and implementation of a cross-organizational Environmental Management System (EMS). As part of the business of managing an international airport, the MDOT MAA's EMS addresses several important issues including sustainability, energy use, environmental conditions (air, water, waste, noise, etc.), and existing contamination. The expansion of the EMS supports MDOT MAA's goal to minimize harmful impacts to the environment while providing efficient air operations and excellent customer service to passengers and tenants. The expanded EMS also provides a formal mechanism for MDOT MAA to consider, define and address environmental risks and opportunities.

EMS
Environmental Management System
*Embracing the Environment*

The update of MDOT MAA's mission statement was an important part of the EMS expansion. The statement has been approved by the CEO and demonstrates the commitment by top management.

## MDOT MAA'S ENVIRONMENTAL MISSION STATEMENT

*The MDOT MAA has committed to proactive environmental risk management, pollution control, continuous improvement in environmental performance, and effective communication with employees and stakeholders.*

## MDOT MAA'S ENVIRONMENTAL MISSION STATEMENT COMMITMENTS

**MANAGEMENT** provides leadership and resources necessary to ensure that the policy is integrated into daily activities;

**EMPLOYEES** provide continuous improvement in environmental performance associated with their jobs;

**COMPLIANCE** with all applicable environmental laws and regulations within its control is continued;

**SUSTAINABILITY PRACTICES** are proactively identified during planning, design, construction, operation and maintenance of its facilities; and

**CONTINUOUS IMPROVEMENT** of MDOT MAA's environmental performance is achieved through regular evaluation of its environmental and business practices.

*MDOT MAA Environmental Mission Statement, signed by Ricky D. Smith, Sr., Executive Director/CEO; September 19, 2016.*

### *2018 GOALS LEADERSHIP*

- Update EMS procedures
- Gain approval of all EMS procedures from Environmental Steering Committee
- Perform internal EMS Audit
- Conduct Management Review
- Publish Green Promotion and Reporting Plan on MDOT MAA intranet with sustainability dashboard

# AIR QUALITY

MDOT MAA has developed an Air Quality Management Plan, which identifies and tracks the various sources of air emissions directly and indirectly generated by the airport. The management plan identifies the type of emissions and pollutants emitted by air transportation at Baltimore/Washington International Thurgood Marshall Airport (BWI Marshall Airport) and Martin State (MTN) Airports.

This plan also develops achievable objectives and measures for MDOT to meet the state goal of 40% Greenhouse Gas (GHG) reduction from 2006 baseline by 2030. This plan is routinely updated to reflect the current operating conditions and procedures at BWI Marshall and MTN Airports.

MDOT MAA has also performed a "gap analysis" on the effort needed for BWI Marshall Airport to pursue the Airports Carbon Accreditation (ACA), a program developed by the Airports Council International (ACI) to enable airports across North America to adopt and implement carbon management policies, methods, and processes to gain public recognition of their achievements (MDOT MAA Airports Carbon Accreditation Gap Analysis, 2017). The gap analysis report is currently under review by MDOT MAA Management to evaluate the costs and benefits of pursuing this certification.

### *2018 GOALS AIR QUALITY*

- Develop specific goals to reduce air emissions at BWI Marshall Airport
- Assist management with decision on pursuing Airport Carbon Accreditation

BWI Marshall Airport currently has several mechanisms available to reduce emissions on and around the airport. Pre-conditioned air (PCAir) is offered at nearly all aircraft gates, which allows the aircraft to circulate fresh air in the cabin without running their engines. Additionally, the smart parking technology employed in the Hourly and Daily Garages assists drivers in quickly and easily finding parking spaces without roaming the garages which allows for a reduction in motor emissions.

# RECYCLING AND WASTE MANAGEMENT

Airport waste is tracked and monitored monthly according to waste stream and location. Each month, the BWI Marshall Airport Office of Contract Support receives a report of the landfill waste and recyclable materials collected at various locations throughout the Terminal and support areas.

### BWI MARSHALL AIRPORT ACHIEVED AN OVERALL RECYCLING RATE OF 32.39% IN 2017

*(December Recycling Report, Maryland Environmental Service.)*

The Maryland State goal is 40% waste diversion.

MDOT MAA participates in recycling of various waste streams:

- Comingled recyclables (plastic, paper, glass, etc.)
- Cardboard
- Scrap metal
- Scrap tires
- Fluorescent lights
- Pallets
- Grease
- Wood and yard debris
- High strength glycol from deicing activities

Used electronics are returned to the Maryland Department of General Services for resale or scrap.

Updated recycling posters were posters were developed for display at MDOT MAA offices to encourage more employees to recycles. The poster is under review by management and will be posted in 2018. A recycling information board was displayed at the MDOT MAA Safety Day on June 21, communicating relevant facts and guidance on recycling. MDOT MAA held its first shredding and recycling event June 26-29, 2017 to facilitate the recycling of unnecessary paper.

### *2018 GOALS RECYCLING & WASTE MANAGEMENT*

- Update tenant directive to encourage increased recycling rates among tenants
- Initiate composting pilot program among eight airport restaurant tenants

## ENERGY

Energy use at BWI Marshall Airport is monitored and tracked by the Energy Manager in the MDOT MAA Office of Facilities Maintenance. The Energy Manager oversees the development and implementation of numerous energy conservation projects and initiatives across the Airport and associated support facilities.

MDOT MAA entered an Energy Performance Contract (EPC) with Pepco in 2010, and 11 energy conservation measures (ECMs) were installed by 2012 and have been integrated into Terminal construction project best practices:

### 1. ENERGY EFFICIENT LIGHTING

Over 37,000 energy efficient lighting fixtures as well as sensors and dimmers were installed to reduce the lighting power density of MDOT MAA buildings.

### 2. DOMESTIC WATER CONSERVATION

Toilets, urinals, faucets, and showers were retrofitted with water-saving fixtures around the Terminal and MDOT MAA support buildings. Over 1,000 new fixtures were installed.

### 3. ENERGY MANAGEMENT CONTROL SYSTEM (EMCS) OPTIMIZATION

The upgrade of the existing energy control system allowed for increased control of equipment and HVAC systems, resulting in energy savings.

### 4. HEATING SYSTEM OPTIMIZATION

Eight variable frequency drives were installed on the primary heating water pumps to allow for variable flow rather than constant flow, saving energy in times of low heating demand.

### 5. CHILLER PLANT OPTIMIZATION

Existing chiller plant controls were upgraded to allow for more precise control of cooling equipment.

### 6. INFRARED HEATING

Existing unit heaters in BWI Marshall Airport Maintenance buildings were replaced with more efficient heating units.

**7. PJM (PENNSYLVANIA, JERSEY, MARYLAND) DEMAND-RESPONSE PROGRAM** - MDOT MAA enrolled in the regional demand-response program, which reduces electric loads provided to the facility when the electric grid is running at or near capacity. The chiller plant optimization and chiller replacement projects also executed under this program allow the MDOT MAA to handle the potential electric load reductions while still providing adequate cooling to the facility.

**8. PHOTOVOLTAIC (PV) SYSTEM ON ROOF OF THE DAILY GARAGE** - The 505 kW solar array on the roof of the Daily Garage generated 524 MW-h of electricity in 2016. MDOT MAA also receives payments from Renewable Energy Certificates (RECs) sold to the electric grid.

**9. PRIMARY LOOP BOILERS** - Six gas-fired condensing boilers were installed, intended to operate during the summer and shoulder seasons when heating demand is low but domestic hot water is still needed. These boilers have a lower energy consumption than the main heating equipment at the Central Utility Plant (CUP).

**10. CHILLER REPLACEMENT** - Two existing, inefficient chillers were replaced with water cooled, variable frequency drive chillers with increased capacity.

**11. ESCALATOR EMCS** - Motor controllers were added to 64 existing motors driving the moving walkways and escalators at BWI Marshall Airport, optimizing energy usage of the equipment.

Pepco's measurement and verification activities have verified the amount of energy saved. At the end of 2016, MDOT MAA had saved approximately $11M in energy and water costs, cumulatively, due to the ECM's installed in 2012. *(Maryland Department of Transportation Maryland Aviation Administration Annual Energy Report, Plan Year 4, Pepco.)*

Outside of the EPC, MDOT MAA is performing LED lighting replacements in the following areas:

- Lower level Terminal curbside
- Pier B Concourse sky lights
- Arrivals roadway up lights
- Pier B Concourse cove lights
- MAC Building parking lot
- Aaronson Drive street lights
- South terminal down lights

MDOT MAA proactively manages its energy consumption to maintain peak loads below 17 MW until 2020.

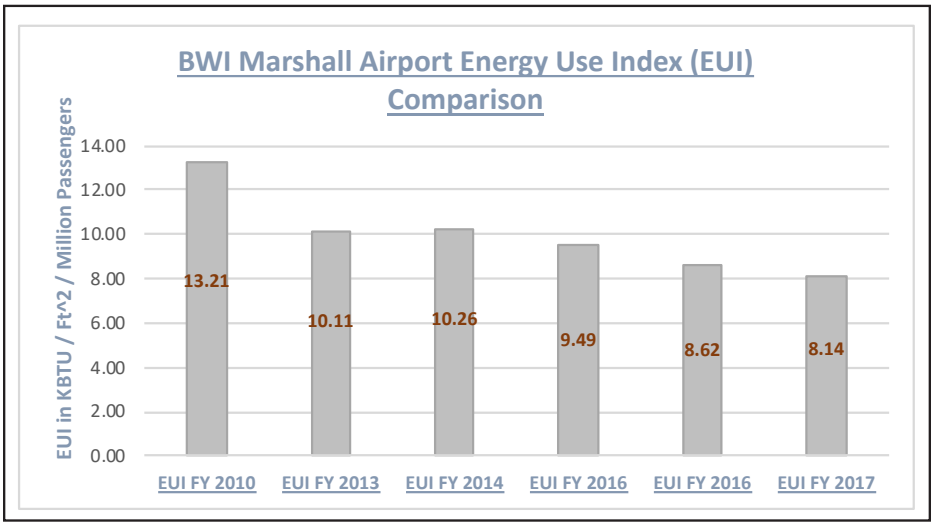
BWI Marshall Airport added over 200,000 square feet of terminal space between 2013 and 2017 and passenger traffic rose from 22.5 million to 26 million during that time. Conversely, the Energy Use Index (EUI) for BWI Marshall Airport declined 19% from 10.11 thousand British Thermal Units (kBTU)/Square Foot/Million Passengers in fiscal year (FY) 2013 to 8.14 kBTU/Square Foot/ Million Passengers in FY 2017. (MDOT MAA Energy Plan, December 2017.)

BWI Marshall Airport has recently initiated a pilot program through Contract Support testing a Schindler ECO Premium energy savings device on one of the skywalk moving walkways (ST-5415 located at B Pier skywalk). This modification to the Airport's moving walkway is possible due to a change in ASME Code in 2013, allowing for variation of escalator/moving walkway speed after the start-up of a unit. The ECO device is expected to be providing energy savings of up to 36% relative to continuous operation. The energy savings device the Airport is installing enables an empty escalator to slow down noiselessly to 30% of its nominal speed thanks to a built-in frequency converter. As soon as a passenger steps on the

### *2018 GOALS ENERGY*

- Continue LED lighting replacements throughout MDOT MAA buildings.
- Continue to employ occupancy sensors, motion sensors, photocells, and other controls to minimize lighting loads.
- Continue to sub-meter areas of the terminal to better manage energy usage, such as tenant areas and concourses.
- Educate building end users to promote energy conservation strategies.
- Expand installations of moving walkway economizers to other locations in the Terminal.

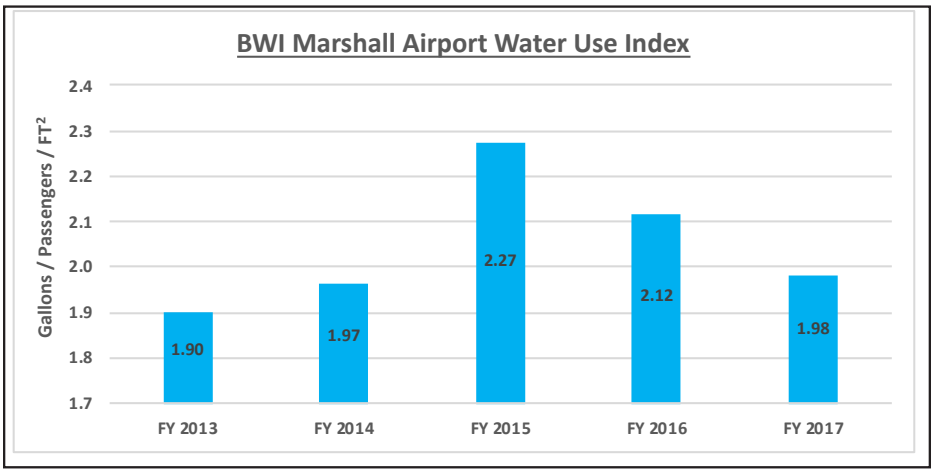
unit, it accelerates again. When the escalator is in slow-speed mode, the passengers can tell not only that it is working, but also in which direction it is running. When there are not passengers on the unit (for a pre-set determined amount of time), electronic sensors will automatically slow the unit speed and begin conserving energy. Once passenger flow is detected, the unit will automatically ramp up to speed to maintain uninterrupted passenger flow. BWI Marshall Airport expects that the benefits realized will include: extended equipment life due to reduced operation and stress on mechanical systems, energy efficiency and improved reliability and performance, while maintaining passenger safety.




*From MDOT MAA Energy Plan, December 2017*

# WATER

Water use at BWI Marshall Airport is monitored and tracked by the Energy Manager in the MDOT MAA Office of Facilities Maintenance. The Energy Manager oversees the development and implementation of numerous water conservation projects and initiatives across the Airport and associated support facilities.




*From MDOT MAA Energy Plan, December 2017*

Low-flow water fixture installations in the Terminal areas resulted in 19,892,000 gallons of water savings (and 863 therms in natural gas water heating savings) in 2015, totaling $145,322. The Water Use Index declined 13% from 2.7 Gallons/ Passengers/Square Foot in fiscal year 2015, to 1.98 Gallons/Passengers/Square Foot in fiscal year 2017. (Maryland Department of Transportation - Maryland Aviation Administration Annual Energy Report, Plan Year 3, Pepco)

### *2018 GOALS WATER*

- Update standards for restroom fixtures in the MDOT MAA Design Standards Manual to reflect current industry standards with regard to water consumption.

# GROUND TRANSPORTATION

MDOT MAA is proactively incorporating alternative fueled buses into its fleet. The current bus fleet is comprised of:

- 50 diesel 40’ coaches
- 25 compressed natural gas (CNG) 40’ coaches

MDOT MAA plans to right-size its fleet requirement and reduce the fleet from 75 to 65 coaches:

- 45 clean diesel coaches (combination of 40’ and 60’)
- 20 CNG 60’ coaches

CNG is the cleanest burning transportation fuel on the market today. CNG burns cleaner than petroleum based products because of its lower carbon content. CNG produces the fewest emissions of all other fuels and contains significantly less pollutants than gasoline. CNG produces 20-30% fewer GHG emissions and 95% fewer tailpipe emissions than petroleum products. And because CNG fuel systems are completely sealed, CNG vehicles produce no evaporative emissions.

Significant progress has been made in reducing air pollution from heavy-duty diesel engines in the past ten years with the introduction of EPA’s new emission standards in 2007 and 2010. Particulate matter (PM), nitrogen oxides (NOx) and greenhouse gas (GHG) emissions from heavy-duty diesel engines were progressively reduced with the development and use of cleaner and more efficient engines, aftertreatment devices, such as diesel particulate filters (DPF) and selective catalytic reduction (SCR), and Diesel Emission Fluid (DEF). Current Clean diesel buses meet most stringent emission requirements.

Alternative transportation is encouraged to the BWI Marshall Airport Terminal. The BWI Marshall Airport Trail provides bicyclists with access to the terminal and provides recreational opportunities for the community. The Baltimore regional Light Rail services the Airport, with stations in the Terminal as well as at the Employee parking lot. The BWI Marshall Airport Amtrak station is just one mile from the Terminal, and free shuttle service is provided to and from the station.

Electric vehicle charging stations have been added to the Hourly Garage (4) and Daily Garage (6) to enable drivers of electric cars to recharge while parked at the Airport.

### *2018 GOALS GROUND TRANSPORTATION*

- Place in-service 20 New 2017 – 60’ New Flyer Xcelsior CNG Coaches

### *2019 GOALS GROUND TRANSPORTATION*

- Place in-service 20 New 2018 – 40’ and 60’ Clean Diesel Coaches


# NATURAL ENVIRONMENT

The natural resources on the BWI Marshall and MTN Airport properties are mapped and inventoried regularly as the Airports develop and are improved. MDOT MAA maintains a Forest Maintenance Plan and wetland delineation to help identify sensitive environmental areas which could be impacted by proposed construction projects.

MDOT MAA actively manages the stormwater quality and quantity at BWI Marshall Airport. MDOT MAA Office of Environmental Services maintains an Institutional Management Plan (IMP) to account for the treatment of stormwater from all current and future development projects. Currently, BWI Marshall Airport is providing stormwater treatment for all of its impervious area, current and proposed in the next five years. Environmental Scientists inspect all existing stormwater management facilities on the MDOT MAA property monthly to ensure that all facilities are functioning properly and providing water quality treatment as designed.

### *2018 GOALS NATURAL ENVIRONMENT*

- Proceed with the design of a green roof on the expanded A/B Baggage Handling System (BHS) to provide stormwater management and total maximum daily load (TMDL) credit.

MDOT MAA actively manages the handling of glycol waste during deicing operations. Under BWI Marshall Airport's National Pollutant Discharge Elimination System (NPDES) permit, MDOT MAA may discharge no more than 30% of the glycol applied to aircraft to the storm drain system. This means that most of the glycol must be collected for recycling or discharge to the Anne Arundel County sanitary sewer system for treatment. BWI Marshall Airport has two deicing pads with collection infrastructure in place to capture as much glycol as possible during winter storm events for discharge to the sanitary sewer. High-strength glycol not diluted by stormwater is collected for recycling at a center near Dulles Airport. MDOT MAA actively manages the amount of glycol applied and collected, and monitors receiving streams for levels of glycol and aquatic health. Typically, MDOT MAA only allows 5% of glycol applied to runoff into the storm drain, well below the maximum levels for the NPDES permit.

# CONCLUSION

MDOT MAA understands the importance of protecting and preserving our air, water, and natural resources while providing exemplary service to our passengers, employees, and the surrounding community. MDOT MAA's commitment to sustainability is exemplified in the following areas:


**LEADERSHIP:** Upper management in the overall MDOT organization as well as within the MAA business unit have issued mission statements placing a focus on environmental sustainability.

**AIR QUALITY:** MDOT MAA actively tracks and monitors sources of air pollutants at the airport and is investigating the Airports Carbon Accreditation.

**RECYCLING AND WASTE MANAGEMENT:** Over 8 waste streams are recycled at the airport, and monthly recycling reports for BWI Marshall Airport and MTN are analyzed for opportunities to increase recycling at MDOT MAA facilities.

**ENERGY:** The Energy Performance Contract completed in 2012 installed 11 energy conservation measures at BWI Marshall Airport, which have saved over $11M in energy costs and reduced energy use per square foot of terminal space per passenger 35% since 2010. Many of these energy management strategies have become standard practice for new construction projects in the Terminal.

**WATER:** Due to the installation of low-flow fixtures throughout the Terminal, water use per square foot of terminal space per passenger has decreased 13% since 2015.

**GROUND TRANSPORTATION:** alternative fueled buses are being incorporated into the MDOT MAA fleet, such as clean diesel and compressed natural gas coaches. Ten electric vehicle charging stations are available in parking garages.

**NATURAL ENVIRONMENT:** Great care is taken to protect the natural resources surrounding the airports from the adverse effects of airport operations and development. Stormwater treatment is provided for all current and planned impervious surfaces at BWI Marshall Airport. Glycol waste from deicing operations is carefully managed to be collected, treated, and recycled when feasible.

As the demand for air travel continues to grow in the Baltimore-Washington region, MDOT MAA is committed to taking additional steps to reduce the impact that the airport and its associated functions have on our environment.